I claim:

1. A bandpass filter comprising:

a passband frequency tuning control which is configured to vary a passband of the bandpass filter;

a Q control gain loop coupled with said tuning control to provide variable Q;

a passband gain control, where said passband gain control is independent of control of said Q control; and,

a gain summation function coupled between said Q control gain loop and said passband gain control.

2. A bandpass filter of claim 1 wherein said passband frequency tuning control is an RC allpass filter.

3. A bandpass filter of claim 2 wherein said RC filter has a resistance control input and a capacitance control input.

4. A bandpass filter of claim 3 wherein said resistance control input uses a multiple bit resistance control input.

5. A bandpass filter of claim 1 wherein said Q control gain loop is controlled by a multiple bit gain/Q control input.

6. A bandpass filter of claim 5 wherein said passband gain control is controlled by a multiple bit passband gain control input which is independent of said multiple bit gain/Q control input.

7. A bandpass filter of claim 6 wherein said multiple bit gain/Q control input and said multiple bit passband gain control are inputs to said gain summation function.

8. A bandpass filter of claim 1 wherein:

said passband gain control includes an initial passband control summer and a passband transfer function operator; and,

said Q control gain loop includes an initial Q control summer and a Q control transfer function operator.

9. A bandpass filter of claim 8 wherein said initial passband control summer and said initial Q control summer are identical.

10. A bandpass filter of claim 8 wherein said passband transfer function operator and said Q control transfer function operator each perform an (S-A)/(S+A) transfer function; where S= jω and A=1/RC.

11. A bandpass filter of claim 10 wherein said passband frequency tuning control performs a transfer function of (S-B)/(S+B) wherein B=1/RC.

12. A bandpass filter comprising:

means for tuning a filter to a passband frequency;

means for controlling Q via controlling a gain;

means for manipulating a gain in said passband frequency; and

wherein said means for controlling and said means for manipulating are independent.

13. A tunable bandpass filter comprising:

a plurality of allpass filter structures; and,

means for tuning a passband frequency of a bandpass filter by controlling only one of the plurality of allpass filter structures in a filter transfer function.

14. A tunable bandpass filter comprising:

a plurality of phase filter functions;

means, independent of the Q of the bandpass filter, for tuning a passband frequency of the bandpass filter with only one of the plurality of phase filter functions.

15. A bandpass filter of claim 12 wherein said means for tuning a passband frequency utilizes a transfer function of: Y

$$=\left[\frac{K_3-K_1K_2}{1+K_4K_2}\right]\left[\left[\frac{S(B-A)}{S^2+S(A+B)\left[\frac{1-K_4K_2}{1+K_4K_2}\right]+(A\bullet B)}\right]+\left[\frac{S^2-(A\bullet B)}{S^2+S(A+B)\left[\frac{1-K_4K_2}{1+K_4K_2}\right]+A\bullet B}\right]\right]$$

Where:

S=jω

K1 is a gain from a first node to an output of a first block and a second block;

K4 is a gain from a second node to an output of said second block, which is a third node;

K3 is a gain from a fourth node to an output of the second block;

K2 is a gain from a fifth node to an output of the second block.

16. A bandpass filter of claim 1 wherein said passband frequency tuning control utilizes a transfer function of: Y

$$=\left[\frac{K_3-K_1K_2}{1+K_4K_2}\right]\left[\left[\frac{S(B-A)}{S^2+S(A+B)\left[\frac{1-K_4K_2}{1+K_4K_2}\right]+(A\bullet B)}\right]+\left[\frac{S^2-(A\bullet B)}{S^2+S(A+B)\left[\frac{1-K_4K_2}{1+K_4K_2}\right]+A\bullet B}\right]\right]$$

Where:

S=jω

K1 is a gain from a first node to an output of a first block and a second block;

K4 is a gain from a second node to an output of said second block, which is a third node;

K3 is a gain from a fourth node to an output of the second block;

K2 is a gain from a fifth node to an output of the second block.